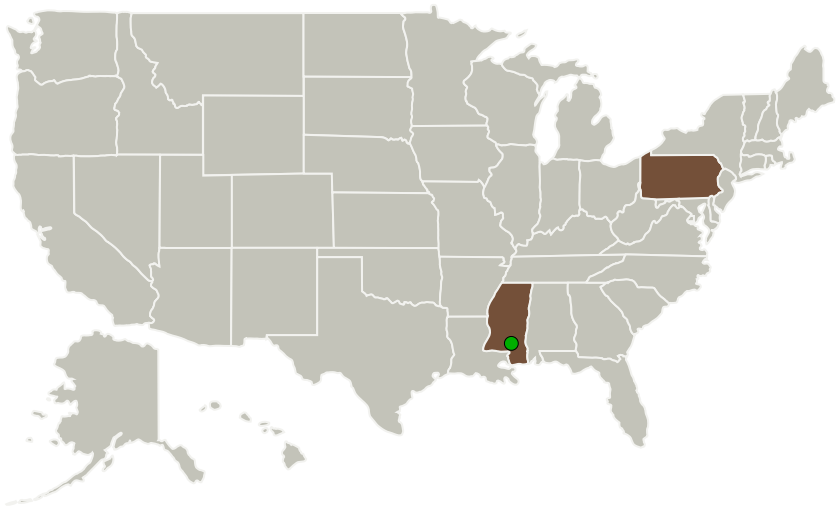
Extreme Environment Ceramic Energy Harvesting/Sensors, Phase II

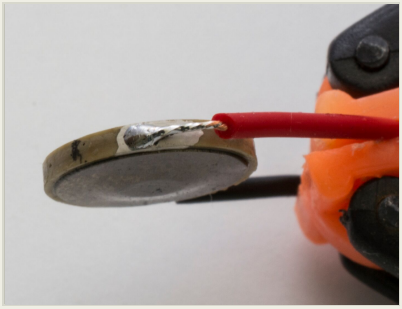
Completed Technology Project (2016 - 2018)

Project Introduction

The program is focused on developing high temperature energy harvesting devices that can convert waste energy (primarily vibratory) such as the mechanical disturbance from thrusters as to include waste exhaust created during operational conditions. The program focus is on developing very high performance devices that are extremely robust and that can continuously operate at up to 500 C. The purpose of this program is to develop new high performance energy conversion devices that can act as a localized power generator for sensors and other devices. The program has already made substantial headway in designing and fabricating simple, rugged, easily installed, high temperature energy conversion devices that can be easily installed on thruster components and other similar high temperature parts. Fortuitously, these new energy conversion devices can equally function as high performance/high temperature capable vibration/pressure sensors. Part of this program has been focused on an important development of the first known (low cost) method for non-epoxy/low temperature joining of ceramics to metals. This cold sinter innovation separately has great potential to address a wide range of other NASA applications in potentially critical ways.

Primary U.S. Work Locations and Key Partners





Extreme Environment Ceramic Energy Harvesting/Sensors, Phase II

Table of Contents

Extreme Environment Ceramic Energy Harvesting/Sensors, Phase II

Completed Technology Project (2016 - 2018)

Organizations Performing Work	Role	Type	Location
Solid State Ceramics, Inc.	Lead Organization	Industry	Williamsport, Pennsylvania
Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi

Primary U.S. Work Locations	
Mississippi	Pennsylvania

Project Transitions

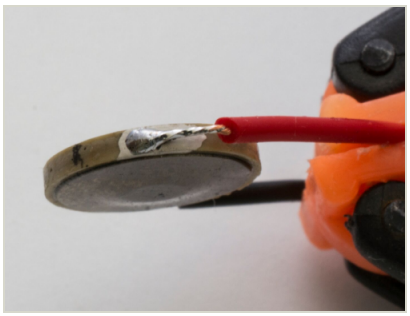
September 2016: Project Start

November 2018: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140788)*

Images



Briefing Chart Image
Extreme Environment Ceramic Energy Harvesting/Sensors, Phase II
(https://techport.nasa.gov/image/135043)

Final Summary Chart Image
Extreme Environment Ceramic Energy Harvesting/Sensors, Phase II
(https://techport.nasa.gov/image/129119)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Solid State Ceramics, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

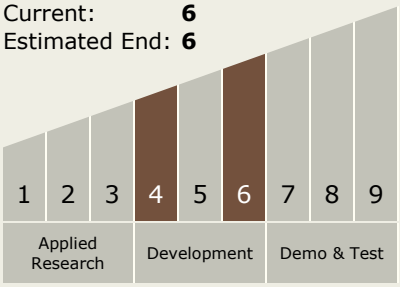
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Safakcan Tuncdemir

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Extreme Environment Ceramic Energy Harvesting/Sensors, Phase II

Completed Technology Project (2016 - 2018)

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.4 Dynamic Energy Conversion

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System